Strand, L. B., Tsai, M. K., Gunnell, D., Janszky, I., Wen, C. P., & Chang, S-S. (2016). Sleep duration, sleep quality and coronary heart disease mortality. *International Journal of Cardiology*, *223*, 534-535. https://doi.org/10.1016/j.ijcard.2016.08.119

We read Dr. Kawada`s commentary (1) on our article (2) with great interest, and we value his thoughts and suggestion for moving this field forward.

Although our data showed statistical evidence for an association of short sleep duration (0-4 h) coronary heart disease (CHD) only among females and in those aged 65 years or older, there was a trend towards increased risk in short sleepers in the whole sample (hazard ratio 1.36, 95% confidence interval 0.88-2.10). Additionally, we examined the quadratic relationship which showed statistical evidence for a U-shaped relationship between sleep duration and CHD mortality in the complete sample (p for quadratic trend = 0.011). Thus, we think it is appropriate to report a U-shaped relationship in this instance. Our findings that this U-shaped relationship was stronger in females and in those aged 65 years or older is novel, and we agree that future studies should further examine this. Furthermore, it is important to be cautious about assuming causality from observational data.

We agree that not only sleep duration, but also sleep quality and other sleep parameters should be payed attention to. In addition to the question about sleep duration, the participants in the health check were also asked the question; ‘‘How have you slept in the past month?’’—there were five response categories: (a) I had difficulties falling asleep, (b) I had no problem falling asleep, but was easily awoken, (c) I dreamt a lot, (d) I needed sleeping pills and (e) I slept well. We have included the results from the analysis the sleep problems below (Table 1).

Our data showed no evidence for an association of self-reported sleep problems at baseline with CHD mortality; although a self-reported need for sleeping pills was associated with 54% increased risk in the sex- and age-adjusted model, the strength of the association was attenuated and its statistical evidence limited in the fully adjusted model (HR = 1.35, 95% CI 0.90-2.03). This analysis was limited by a relatively small number of deaths in the ‘need sleeping pills’ group (n=32), and that sleep problems were measured only once at baseline by self-report. Furthermore, participants were instructed to choose only one response to the sleep problem question and thus the analysis was limited in identifying individuals with multiple and severe sleep problems.

Table 1. Hazard ratios (HR) for the association of sleep problems with coronary heart disease (CHD) mortality in the MJ health check-up programme, Taiwan (N = 392 164)

			Model 1		Model 2		Model 3	
	Cases	Person-years	HR	95% CI	HR	95% CI	HR	95% CI
Sleep problems								
None	273	1 435 948	1.00		1.00		1.00	
Difficult getting to sleep	110	450 958	1.13	0.90, 1.41	0.99	0.79, 1.24	1.01	0.80, 1.26
Easily awoken	222	1 187 236	0.91	0.77, 1.09	0.90	0.76, 1.08	0.91	0.76, 1.09
Dreamed a lot	74	626 806	0.79	0.61, 1.02	0.75	0.58, 0.97	0.78	0.60, 1.01
Need sleeping pills	32	50 740	1.54	1.07, 2.23	1.16	0.80, 1.69	1.35	0.90, 2.03

Model 1: Adjusted for age and sex

Model 2: Adjusted for age, sex, education and marital status, smoking, alcohol consumption, physical activity, history of hypertension, history of diabetes and history of heart diseases

Model 3: Adjusted for age, sex, education, marital status, smoking, alcohol consumption, physical activity, history of hypertension, history of diabetes, history of heart disease, body mass index, systolic blood pressure, fasting glucose, total cholesterol, HDL cholesterol, triglycerides and use of hypnotics/sedatives

In regard to the categorization of sleep duration, the National Sleep Foundation in the United States has the recommended normal sleep duration as '7-9 h' for healthy adults aged between 26 and 64 years and '7-8 h' for those aged 65 years or older based on expert consensus which involved 18 panelists, assisted by a systematic review of literature which identified 312 relevant articles (3). Participants in the health check were only given four response options to describe their sleep duration (0-4, 4-6, 6-8 or >8 h per night), so we had a limited choice of reference categories. We chose 6-8 h as the reference category in our models because it a) included most of the recommended sleep periods and b) was the most commonly reported sleep duration, leading to more precise estimates of risk in the other sleep categories. Future research could contribute to the evidence base of any recommendations or guidelines by categorizing sleep duration consistent with the recommendations / guidelines, but this was not an option in our study.

References

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